

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

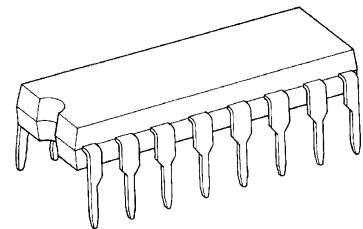
TA7745P, TA7745F

DC MOTOR DRIVER

FEATURES

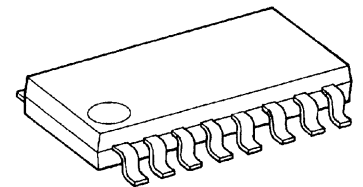
- 3 Phase Power Driver.
- Voltage Control System.
- High Efficiency is Obtained.
- Capsealed in Flat Package 16Pin.
- Operating Voltage Range : $V_{CC} = 4.0 \sim 15 \text{ V}$
 $V_S = 2 \sim 15 \text{ V}$
- High Sensitivity of Position Sensing Inputs and Have a Hysteresis : $V_H = 20 \text{ mV}_{p-p}$ (Typ.)
- Output Current : $I_O (\text{MAX.}) = 1.0 \text{ A}$
- Build in Thermal Shut Down Circuit.
- Forward and Reverse Rotation and Stop Modes are Available by Means of Rotation Control Terminal.

TA7745P



DIP16-P-300-2.54A

TA7745F



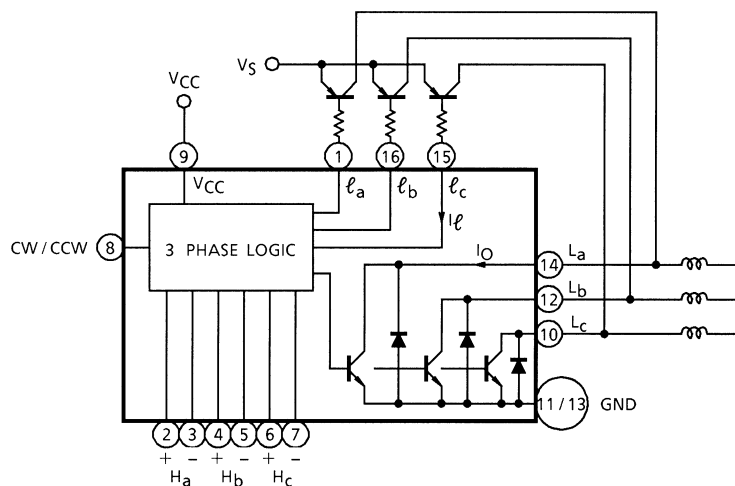
SSOP16-P-225-1.00A

Weight

DIP16-P-300-2.54A : 1.11g (Typ.)

SSOP16-P-225-1.00A: 0.14g (Typ.)

BLOCK DIAGRAM



PIN FUNCTION

PIN No.	SYMBOL	FUNCTIONAL DESCRIPTION
1	I_a	a-phase Pre-drive stage output terminal
2	H_{a+}	a-phase Hall Amp. positive input terminal
3	H_{a-}	a-phase Hall Amp. negative input terminal
4	H_{b+}	b-phase Hall Amp. positive input terminal
5	H_{b-}	b-phase Hall Amp. negative input terminal
6	H_{c+}	c-phase Hall Amp. positive input terminal
7	H_{c-}	c-phase Hall Amp. negative input terminal
8	CW / CCW	Forward rotation / reverse rotation switch terminal
9	V_{CC}	Power Supply input terminal
10	L_c	c-phase drive output terminal
11	GND	GND terminal
12	L_b	b-phase drive output terminal
13	GND	GND terminal
14	L_a	a-phase drive output terminal
15	I_c	c-phase Pre-drive stage output terminal
16	I_b	b-phase Pre-drive stage output terminal

FUNCTION

FRS (8 PIN)	POSITION SENSING INPUT			COIL OUTPUT		
	H_a	H_b	H_c	L_a	L_b	L_c
V_{RVS}	1	0	1	H	L	M
	1	0	0	H	M	L
	1	1	0	M	H	L
	0	1	0	L	H	M
	0	1	1	L	M	H
	0	0	1	M	L	H
V_{FWD}	1	0	1	L	H	M
	1	0	0	L	M	H
	1	1	0	M	L	H
	0	1	0	H	L	M
	0	1	1	H	M	L
	0	0	1	M	H	L
V_{STOP}	1	0	1	High Impedance		
	1	0	0			
	1	1	0			
	0	1	0			
	0	1	1			
	0	0	1			

MAXIMUM RATINGS (Ta = 25°C)

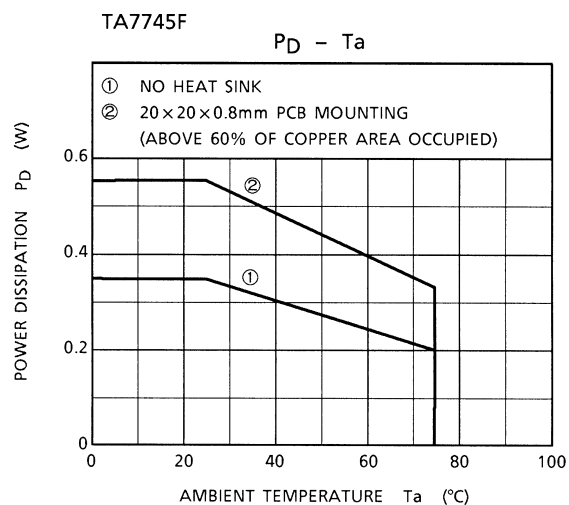
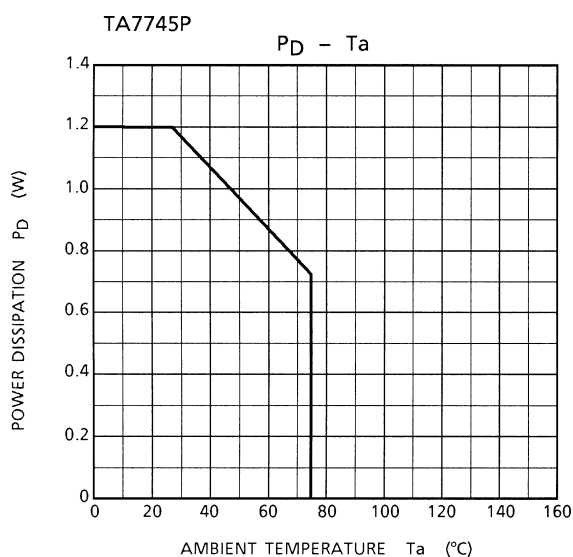
CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V _{CC}	18	V
		V _S	18	V
Output Current		I _O	1.0	A
		I _t	20.0	mA
Power Dissipation	TA7745P	P _D	350	mW
			550 (Note)	
	TA7745F		1200	
Operating Temperature		T _{opr}	-30~75	°C
Storage Temperature		T _{stg}	-55~150	°C

Note: This rating is obtained by mounting on 20 × 20 × 0.8 mm PCB that occupied above 60% of copper area.

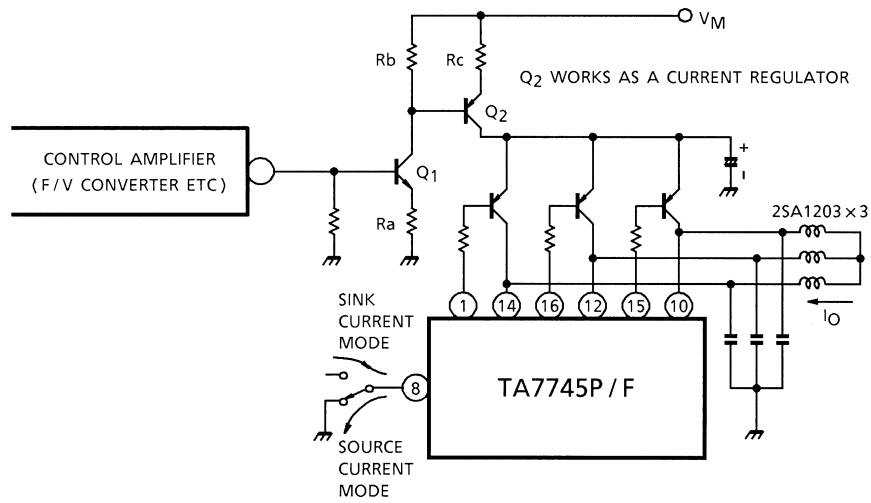
ELECTRICAL CHARACTERISTICS (Unless otherwise specified, Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Supply Current		I _{CC1}		V _{CC} = 5 V, Output "OPEN"	0.5	1	3.0	mA
		I _{CC2}		V _{CC} = 9 V, Output "OPEN"	0.6	1.3	3.5	
		I _{CC3}		V _{CC} = 12 V, Output "OPEN"	0.7	1.5	5.0	
Saturation Voltage	L _a , L _b , L _c Side	V _{SL-1}		I _O = 0.1 A	—	0.12	0.3	V
		V _{SL-2}		I _O = 0.5 A	—	0.5	1.0	
	ℓ _a , ℓ _b , ℓ _c Side	V _{SU}		I _ℓ = 1.0 mA	—	—	0.2	
Position Sensing Input	Sensitivity	V _H			—	20	—	mV
	Operating DC Level	CMR-H			1	—	V _{CC} -1.5	V
Diode Forward Voltage		V _F		I _F = 1 A	—	2.0	—	V
Rotation Control Input Voltage	Forward	V _{FWD}		Source current mode	3.9	—	V _{CC}	V
	Stop	V _{STOP}		No current flow (Note)	1.8	—	2.6	
	Reverse	V _{RVS}		Sink current mode	0	—	0.9	
Saturation Voltage Differential (L _a , L _b , L _c Side)		ΔV _S		I _O = 200 mA	—	—	50	mV
Leakage Current		I _L		V = 18 V	—	—	50	μA

Note: IC is stop mode when (8) pin supplied 1.8 V~2.6 V or open.



APPLICATION CIRCUIT 1 (3 phase Bi-Pola drive)

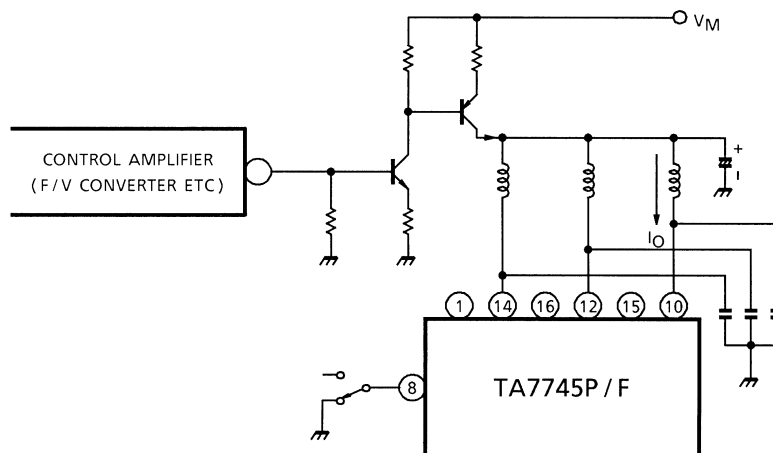


$$I_o \approx \frac{R_b}{R_a R_c} V_{IN} - \frac{1}{R_c} \left(\frac{R_b}{R_c} V_{BE1} + V_{BE2} \right)$$

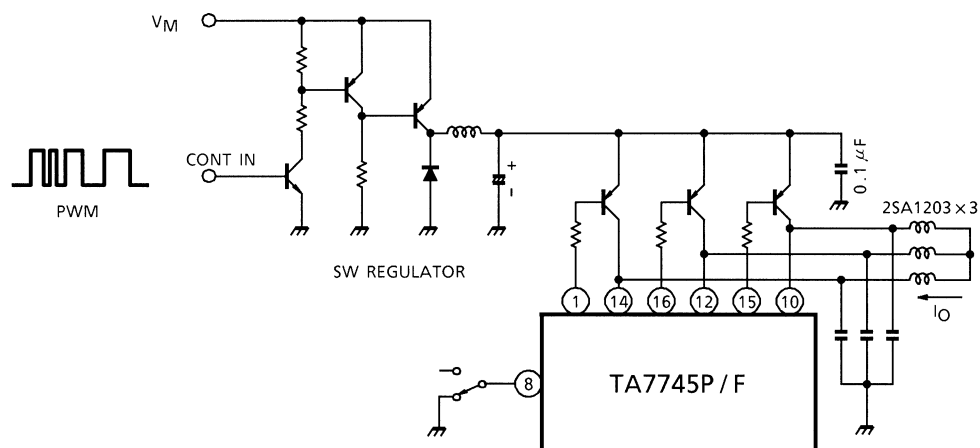
$$\approx (K_1 \cdot V_{IN}) + K_2$$

($K_1, K_2 = \text{CONSTANT}$)

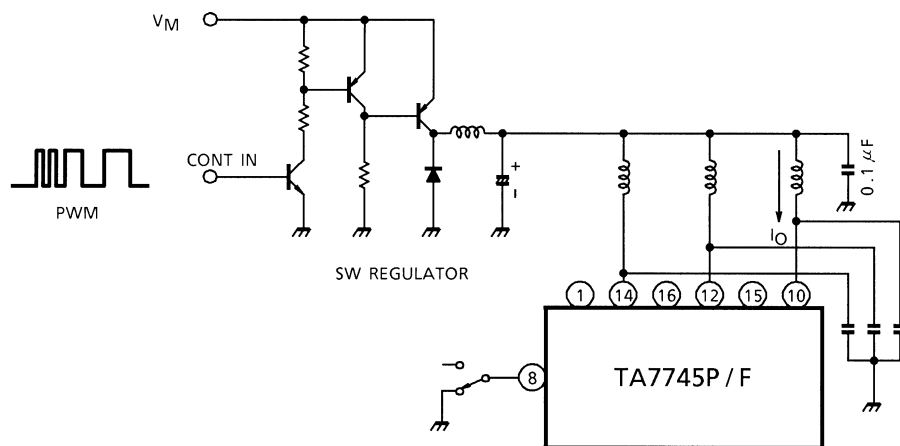
APPLICATION CIRCUIT 2 (3 phase UNI-Pola drive)



APPLICATION CIRCUIT 3 (High efficiency drive (UNI-Pola))



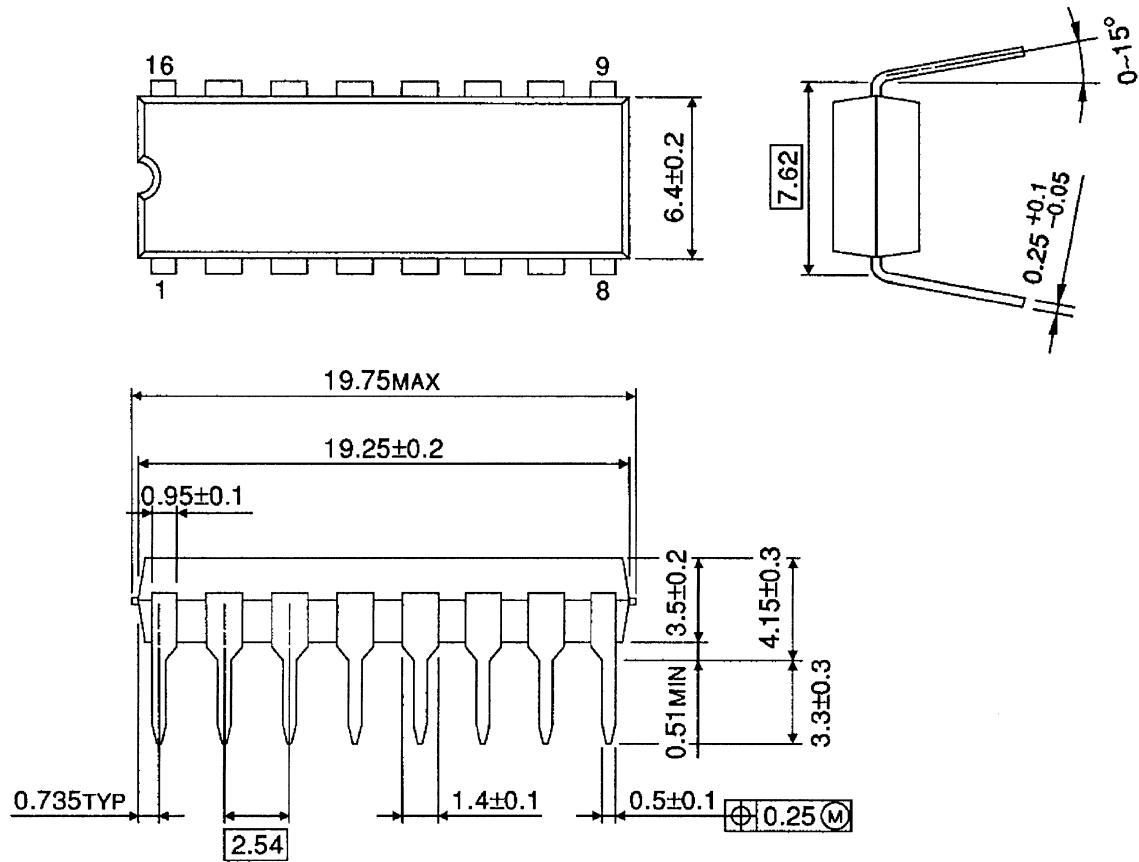
APPLICATION CIRCUIT 4 (High efficiency drive (Bi-Pola))



PACKAGE DIMENSIONS

DIP16-P-300-2.54A

Unit: mm

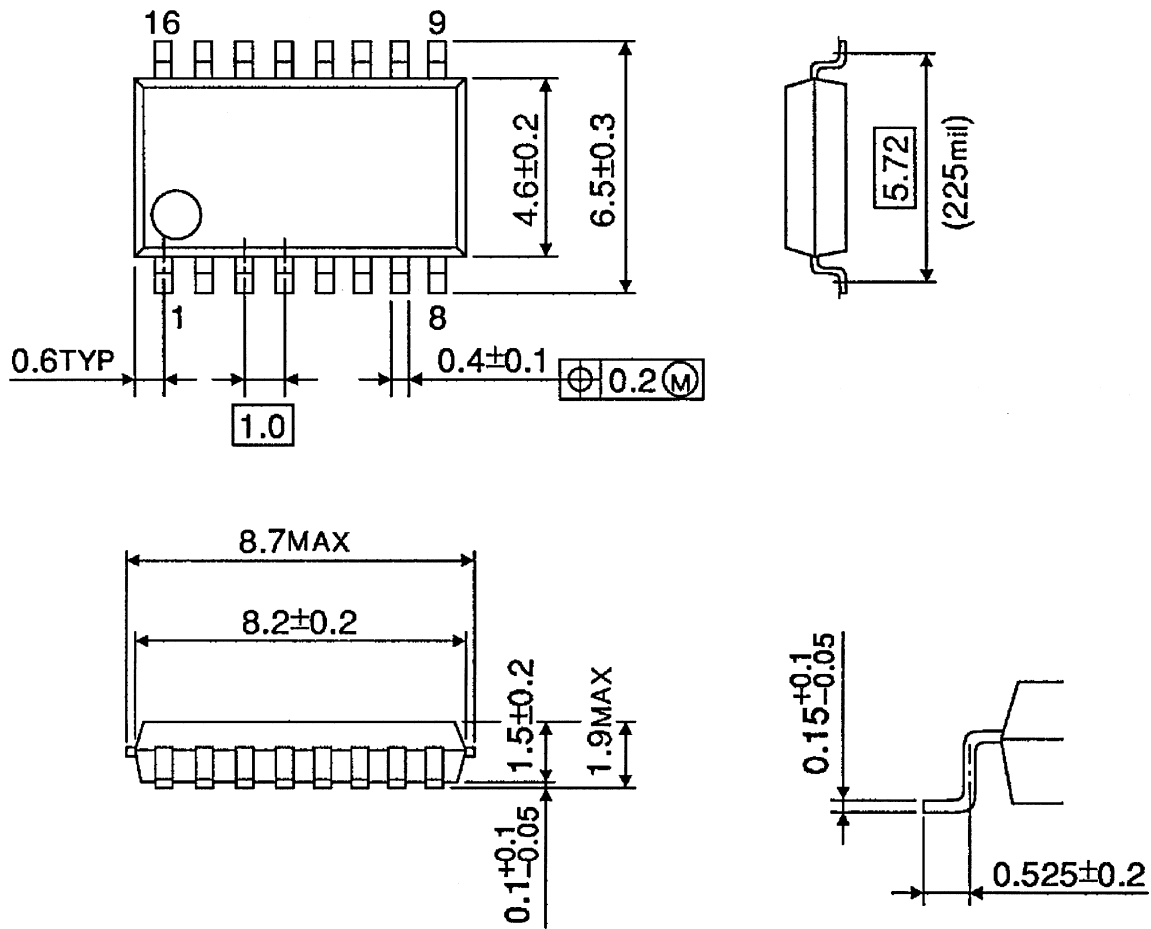


Weight: 1.11 g (Typ.)

PACKAGE DIMENSIONS

SSOP16-P-225-1.00A

Unit: mm



Weight: 0.14 g (Typ.)

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000707EBA

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